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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,154	07/21/2005	Hiroyuki Sakamoto	27604-00001-US1	6527

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EXAMINER	
MCNALLY, DANIEL	
ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
09/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,154	SAKAMOTO ET AL.	
	Examiner	Art Unit	
	DANIEL MCNALLY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 4, 6-9, 12, 13 and 21* is/are pending in the application.

4a) Of the above claim(s) *13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-9,12 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/27/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/4/2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4, 6-9, 12, and -21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US4781969, of record, previously cited, herein "Kobayashi") in view of Suzuki et al. (US4844784, of record, previously cited, herein "Suzuki") and Sakamoto et al. (US6262146, of record, previously cited, herein "Sakamoto").

Kobayashi discloses a flexible printed circuit board. The flexible printed circuit board is formed by adhesively bonding conductive layers (6,6) with adhesive layers (3,3) to a dielectric layer (2) (column 2, lines 24-33). The conductive layers comprise a metal material. The dielectric layer is a functional material. The adhesive layers are

considered insulating layers. Kobayashi does not disclose the adhesive as a cationic electrodepositable adhesive that is formed on the conductive metal layer by electrodeposition.

Suzuki discloses a method of bonding flexible circuit substrates (column 1, line 61-column 2, line 34; column 3, line 10-column 4, line 39). The method comprises forming an adhesive layer on electroconductive surfaces using electrodeposition, drying the adhesive layer without curing the adhesive, Suzuki discloses the drying temperature can be about 80°C for 5 minutes, the substrates to be bonded are brought together, and a bond is formed under heat and pressure. Suzuki discloses the electrodeposition method allows for a formation of a uniform coating only on the desired circuit parts.

Sakamoto discloses a method of electrodepositing a cationic resin composition onto a conductive metal substrate. Sakamoto discloses using cationic electrodepositing in order to better control the thickness of the cationic resin and because of the excellent throwing power and improved impact resistance. Sakamoto discloses the composition of the cationic adhesive comprises sulfonium groups and propargyl groups. Sakamoto discloses the cationic adhesive composition is water based and baked to cure. Because the adhesive is water based, there are no volatile components in the solvent to be generated. Furthermore, the electrodepositing method of Suzuki comprises a drying step that removes any water and volatiles using the heat for drying.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Kobayashi by electrodepositing an electrodepositable adhesive layer onto the conductive surface as taught by Suzuki in order to form a

uniform coating layer only at the desired bonding areas, and to modify the method of Kobayashi by using the electrodepositable cationic resin composition as taught by Sakamoto in order to improve the thickness control and the throwing power when forming the layer.

With regard to claim 4, Sakamoto discloses the composition of the cationic adhesive allows the formation of chemical species activated by an electrode reaction caused by a voltage application during the electrodeposition.

With regard to claim 6, Sakamoto discloses the composition has a sulfonium group content of 5 to 400 millimoles, a propargyl content of 10 to 315 millimoles and a total content not more than 500 millimoles per 100g of solid.

With regard to claims 7, Sakamoto discloses the composition has a sulfonium group content of 5-250 millimoles, a propargyl content of 20-295 millimoles and a total content not more than 400 millimoles per 100g of solid.

With regard to claim 8, Sakamoto and Suzuki disclose the composition has an epoxy resin skeleton.

With regard to claim 9, Sakamoto discloses the epoxy resin comprises novolak phenol epoxy resin or novolak cresol epoxy resin in an average molecular weight of 500 to 20,000.

With regard to claim 12, Kobayashi discloses the dielectric material as an organic material.

With regard to claim 21, Suzuki discloses drying the adhesive at 80°C for 5 minutes.

4. Claims 1, 4, 6-9, 12, and -21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US4781969, of record, previously cited, herein "Kobayashi") in view of Yoshida (US4096009, newly cited, herein "Yoshida") and Sakamoto et al. (US6262146, of record, previously cited, herein "Sakamoto").

Kobayashi discloses a flexible printed circuit board. The flexible printed circuit board is formed by adhesively bonding conductive layers (6,6) with adhesive layers (3,3) to a dielectric layer (2) (column 2, lines 24-33). The conductive layers comprise a metal material. The dielectric layer is a functional material. The adhesive layers are considered insulating layers. Kobayashi does not disclose the adhesive as a cationic electrodepositable adhesive that is formed on the conductive metal layer by electrodeposition.

Yoshida discloses a method of bonding a metal substrate to another material using an electrodepositable adhesive layer. The method comprises forming an adhesive layer on an electroconductive surface using electrodeposition, drying the adhesive layer at room temperature or by applying heat, the material to be bonded to the metal is contacted with the adhesive layer and heat and pressure are applied to complete the bonding process (column 9, lines 20-31). Yoshida discloses using an electrodepositable adhesive in order to improve the bond strength.

Sakamoto discloses a method of electrodepositing a cationic resin composition onto a conductive metal substrate. Sakamoto discloses using cationic electrodepositing in order to better control the thickness of the cationic resin and because of the excellent throwing power and improved impact resistance. Sakamoto discloses the composition

of the cationic adhesive comprises sulfonium groups and propargyl groups. Sakamoto discloses the cationic adhesive composition is water based and baked to cure. Because the adhesive is water based, there are no volatile components in the solvent to be generated. Furthermore, the electrodepositing method of Suzuki comprises a drying step that removes any water and volatiles using the heat for drying.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Kobayashi by electrodepositing an electrodepositable adhesive layer onto the conductive surface as taught by Yoshida in order to increase the bond strength at the conductive surface, and to modify the method of Kobayashi by using the electrodepositable cationic resin composition as taught by Sakamoto in order to improve the thickness control and the throwing power when forming the layer.

With regard to claim 4, Sakamoto discloses the composition of the cationic adhesive allows the formation of chemical species activated by an electrode reaction caused by a voltage application during the electrodeposition.

With regard to claim 6, Sakamoto discloses the composition has a sulfonium group content of 5 to 400 millimoles, a propargyl content of 10 to 315 millimoles and a total content not more than 500 millimoles per 100g of solid.

With regard to claims 7, Sakamoto discloses the composition has a sulfonium group content of 5-250 millimoles, a propargyl content of 20-295 millimoles and a total content not more than 400 millimoles per 100g of solid.

With regard to claim 8, Sakamoto disclose the composition has an epoxy resin skeleton.

With regard to claim 9, Sakamoto discloses the epoxy resin comprises novolak phenol epoxy resin or novolak cresol epoxy resin in an average molecular weight of 500 to 20,000.

With regard to claim 12, Kobayashi discloses the dielectric material as an organic material.

With regard to claim 21, Yoshida discloses drying the adhesive at room temperature or by applying heat. Yoshida also provides and example where heat is applied to a temperature of 120ºC. It would have been well within the purview of one of ordinary skill in the art at the time of invention to use a drying temperature within the range of room temperature to 120ºC, in order to optimize the drying time in relation to the amount of energy used for drying.

Response to Arguments

5. Applicant's arguments filed 9/4/2008 have been fully considered but they are not persuasive. Applicant argues Sakamoto fails to disclose the cationic resin composition can be used as an adhesive or to provide insulation. Kobayashi discloses an adhesive layer is between the electroconductive surface and a function material. The adhesive layer is an insulating layer in the broadest interpretation of "insulating" because the adhesive layer separates the two layers and serves are a barrier between the two materials. For example the adhesive layer would be capable of contributing some type thermal insulation by inhibiting or reducing the amount of heat transferred between the electroconductive layer and the functional layer. Suzuki, previously cited, and Yoshida,

newly cited, both teach electrodepositing layers can be used as an adhesive layer when an electrodepositable material is applied to the surface of the electroconductive layer. Sakamoto discloses a preferred electrodepositable material. The electrodepositable material of Sakamoto is considered to inherently be an insulating material as claimed because the composition of Sakamoto's electrodepositable material is the same as the claimed composition and therefore would have the same properties and characteristics.

Applicant also argues Suzuki discloses an electroconductive adhesive layer, rather than an insulating adhesive. The adhesive layer is an insulating layer in the broadest interpretation of "insulating" because the adhesive layer separates the two layers and serves are a barrier between the two materials. For example the adhesive layer would be capable of contributing some type thermal insulation by inhibiting or reducing the amount of heat transferred between the two layers which are bonded together by the adhesive. The word "insulating" does not necessarily require a non-electroconductive material. In any event the adhesive of Suzuki is not required to be electroconductive in order to be electrodeposited nor in order to be an adhesive. Suzuki is merely cited to show that eletrodepositable materials can be used as adhesives. The teachings of Sakamoto are relied upon for the type of electrodepositable material applied. The material of Sakamoto is considered to inherently be an insulating material as claimed because the composition of Sakamoto's electrodepositable material is the same as the claimed composition and therefore would have the same properties and characteristics. Furthermore an alternative rejection is made in view of newly cited Yoshida which shows that electrodepositable materials can be used as adhesives, as

similarly taught by Suzuki. However Yoshida differs from Suzuki because the adhesive of Yoshida is not an electroconductive adhesive.

In view of the above discussion all limitations of the claims are satisfied by the applied prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL MCNALLY whose telephone number is (571)272-2685. The examiner can normally be reached on Monday - Friday 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel McNally/
Examiner, Art Unit 1791

/John L. Goff/
Primary Examiner, Art Unit 1791

/DPM/
September 19, 2008